School of Planning and Architecture: Vijayawada
(An institution of National Importance under the Ministry of Education, Govt. of India)
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture

Course: **ARC 224; Structural Analysis** **Class:** II Yr B.Arch IV Sem A.Y. 2023-24
Instructors: Dr. P. Siva Prasad **Internal Assessment:** 50
External Theory Exam: 50
Contact Periods/ week: 04 periods (55 min each) **Total Marks:** 100
Time Table: **Credits:** 4
Attendance: Min 75% **Min. Passing Marks:** 50% each in Internal & External Assessment, 50% in Aggregate

Objective: To impart the knowledge of methods of analysis of fixed beams, continuous beams, columns, struts, bolted connections, welded connections, retaining walls and also Bearing capacity of foundation soil.

Out Line of the Course:

LECTURE PLAN

WEEK	DATE	TOPIC OF CLASS LECTURE & DISCUSSION	TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS
1	Week-1	Analysis of fixed beams. Draw shear force diagram and bending moment diagrams.	Lecture, Discussion & Studio
2	Week-2	Analysis of Continuous beams by Theorem of Three moments or by any other method. Draw shear force diagram and bending moment diagrams.	Lecture, Discussion & Studio
3	Week-3	Columns and Struts. Different end conditions of columns. Equivalent length, critical load carrying capacity of Columns.	Lecture, Discussion & Studio
4	Week-4	Buckling and crushing failure of columns. Euler's theory, Rankine's formula.	Lecture, Discussion & Studio
5	Week-5	Introduction, terminology, factors affecting bearing capacity of soils, methods of determining bearing capacity.	Lecture, Discussion & Studio
6	Week-6	Types of failures in soil, methods of improving bearing capacity of soil.	Lecture, Discussion & Studio
7	Week-7	**Mid-Semester examination**	**Mid-semester examination**

8	Week-8	Settlement of foundations. Plate load test.	Lecture, Discussion & Studio
9	Week-9	Concept of Bearing Pressures, calculation of maximum and minimum bearing pressures.	Lecture, Discussion & Studio
10	Week-10	Understanding the concept of stability of Retaining walls and masonry structures.	Lecture, Discussion & Studio
11	Week-11	Introduction to Steel Structural elements. Different types of Connections / Joints. Welded connections, analysis and design as per IS:800.	Lecture, Discussion & Studio
12	Week-12	Types of Bolted connections, analysis and design as per IS:800. Lap Joint, Butt Joint, etc.	Lecture, Discussion & Studio
13	Week-13	Introduction, experimental concepts related to soil mechanics and concrete technology tests.	Lecture, Discussion & Studio
14	Week-14	Test for Field Density of Soil, Liquid limit and plastic limit of soil, Water absorption test on coarse aggregate.	Demo
15	Week-15	Test for Compressive strength of Concrete Cubes, Compressive Strength of Concrete Cylinders, Split tensile strength of Concrete.	Demo

S. No.	Stages of Evaluation	Weightage
1	First stage: Assessment –1	15
2	Second stage: Mid-semester Examination	20
3	Third stage: Assessment –3	15
	Total	50

Reference Books:

1. Junnarkar, S. B. (1997). Mechanics of Structures. Vol. II. 22nd Ed. CharotarPublishers.
2. Punmia, B. C., Jain, A. K. and Jain, A. K. (1992). Theory of Structures. 9thEd. New Delhi : Laxmi Publications.
3. Ramamrutham, S. Theory of Structures. New Delhi : Tata McGraw Hill Education.
4. Reddy, C. S. (1999). Basic Structural Analysis. New Delhi : Tata McGraw-Hill Education.
5. Vazirani and Ratwani. (2008). Analysis of Structures. Vol. I. New Delhi :Khanna Publishers.
6. Bhavikatti, S. S. (2010). Design of Steel Structures. I.K. International Publishing House.

Course Instructors:

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(Dr. P. Siva Prasad)

Head of Department :

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